

WHAT IS CLAIMED IS:

1. A transmission state indicating method comprising:

in accordance with a predetermined transmission system, high capacity data is divided into a plurality of low capacity virtual containers and transmitted via a plurality of channels which configure a communication network based on clocks at the respective channels, 5 acquiring a multiplexed frame in which mapping, accompanying delay absorption processings corresponding to transmission states at the respective channels, has been carried out based on a reference clock with respect to virtual containers at the respective channels included in a plurality of frames including 10 the plurality of low capacity virtual containers;

successively detecting factors at the respective channels which are respectively included in the plurality of frames included in the multiplexed frame, and which are to be objects for delay absorption processings corresponding to the transmission states at the respective channels, as a plurality of pointer values for respectively evaluating the transmission states at said plurality of channels which configure 15 the communication network;

20 successively correcting the plurality of pointer values based on variations in phases at the respective channels which are detected from phase differences 25

between the clocks at the respective channels and the reference clock; and

5 indicating the plurality of pointer values successively corrected, at the same time, corresponding to the plurality of channels.

2. The transmission state indicating method according to claim 1, further comprising:

10 storing said plurality of pointer values in association with information for indicating said plurality of pointer values at the same time in accordance with said plurality of channels; and

15 reading out the plurality of pointer values stored in association with the information for indicating the plurality of pointer values corresponding to the plurality of channels, at the same time.

3. The transmission state indicating method according to claim 1, further comprising:

20 carrying out processing for indicating said plurality of pointer values by relative values with respect to a pointer value of a reference channel to be a reference among said plurality of channels when said plurality of pointer values are indicated at the same time corresponding to the plurality of channels.

25 4. The transmission state indicating method according to claim 1, wherein, when the predetermined transmission system is an SDH (Synchronous Digital Hierarchy) system, the plurality of pointer values

include, as factors of the respective channels to be objects for the delay absorption processings, values of AU (Administrative Unit) pointers included in H1 bytes and H2 bytes which have been defined to show head portions of the virtual containers in case where the low capacity containers are contained in a payload, at the 4th row of an SOH (Section Overhead) frame in which the plurality of frames are frames of an STM (Synchronous transfer mode) and which is added to the payload of the frame of the STM.

5. The transmission state indicating method according to claim 1, wherein, when the predetermined transmission system is an SDH (Synchronous Digital Hierarchy) system, the plurality of pointer values include, as factors of the respective channels to be objects for the delay absorption processings, a value of H4 byte which has been defined at the 6th row of a POH (Pass Overhead) added to head portions of the respective virtual containers in case where said plurality of frames are frames of an STM (Synchronous transfer mode) and the virtual containers included in the frames of the STM are a VC-3 format or a VC-4 format.

20 6. The transmission state indicating method according to claim 1, wherein, when the predetermined transmission system is an SDH (Synchronous Digital Hierarchy) system, the plurality of pointer values

include, as factors of the respective channels to be the objects for the delay absorption processings, values of AU (Administrative Unit) pointers included in H1 bytes and H2 bytes which have been defined to show 5 head portions of the virtual containers in case where the low capacity containers are contained in a payload, at the 4th row of an SOH (Section Overhead) frame in which said plurality of frames are frames of an STM (Synchronous transfer mode) and which is added to the 10 payload of the frame of the STM, and a value of H4 byte which has been defined at the 6th row of a POH (Pass Overhead) added to the head portions of the respective 15 virtual containers in case where said plurality of frames are frames of the STM (Synchronous transfer mode) and the virtual containers included in the frames of the STM are a VC-3 format or a VC-4 format.

7. The transmission state indicating method according to claim 1, further comprising:

20 converting the multiplexed frame on which mapping has been carried out into a concatenation mapping frame according to the rules of concatenation mapping; and detecting a plurality of index values included in the concatenation mapping frame converted according to rules of the concatenation mapping in place of the 25 multiplexed frame on which mapping has been carried out.

8. A transmission state indicating apparatus

comprising:

a multiplexed frame acquiring unit, in accordance with a predetermined transmission system, high capacity data is divided into a plurality of low capacity virtual containers and transmitted via a plurality of channels which configure a communication network based on clocks at the respective channels, which acquires a multiplexed frame in which mapping, accompanying delay absorption processings corresponding to transmission states at the respective channels, has been carried out based on a reference clock with respect to the virtual containers at the respective channels included in a plurality of frames including said plurality of low capacity virtual containers;

15 a pointer value detecting unit which successively detects factors at the respective channels which are respectively included in the plurality of channels included in the multiplexed frame acquired by the multiplexed frame acquiring unit, and which are to be 20 objects for delay absorption processings corresponding to the transmission states at the respective channels, as a plurality of pointer values for respectively evaluating the transmission states at the plurality of channels which configure the communication network, and 25 which successively corrects the plurality of pointer values based on variations in phases at the respective channels to be detected from phase differences between

the clocks at the respective channels and the reference clock; and

a display unit which indicates the plurality of pointer values successively detected and corrected by the pointer value detecting unit, at the same time, corresponding to the plurality of channels.

9. The transmission state indicating apparatus according to claim 8, further comprising:

a storage unit which stores said plurality of pointer values successively detected and corrected by the pointer value detecting unit in association with information for indicating the plurality of pointer values at the same time in accordance with the plurality of channels; and

15 a control unit which reads said plurality of pointer values stored in association with the information for indicating said plurality of pointer values corresponding to the plurality of channels at the storage unit, at the same time.

20 10. The transmission state indicating apparatus according to claim 8, further comprising:

a control unit which carries out processing for indicating the plurality of pointer values successively detected and corrected by the pointer value detecting unit, by relative values with respect to a pointer value of a reference channel to be a reference among the plurality of channels in the case where said

plurality of pointer values are indicated at the same time corresponding to the said plurality of channels.

11. The transmission state indicating apparatus according to claim 8, wherein, when the predetermined transmission system is an SDH (Synchronous Digital Hierarchy) system, the plurality of pointer values include, as factors of the respective channels to be objects for the delay absorption processings, values of AU (Administrative Unit) pointers included in H1 bytes and H2 bytes which have been defined to show head portions of the virtual containers in case where the low capacity containers are contained in a payload, at the 4th row of an SOH (Section Overhead) frame in which the plurality of frames are frames of an STM (Synchronous transfer mode) and are added to payloads of the frames of the STM.

12. The transmission state indicating apparatus according to claim 8, wherein, when the predetermined transmission system is an SDH (Synchronous Digital Hierarchy) system, the plurality of pointer values include, as factors of the respective channels to be objects for the delay absorption processings, a value of H4 byte which has been defined at the 6th row of a POH (Pass Overhead) added to head portions of the respective virtual containers in case where the plurality of frames are frames of an STM (Synchronous transfer mode) and the virtual containers included in

the frames of the STM system are a VC-3 format or a VC-4 format.

13. The transmission state indicating apparatus according to claim 8, wherein, when the predetermined transmission system is an SDH (Synchronous Digital Hierarchy) system, the plurality of pointer values include, as factors of the respective channels to be objects for the delay absorption processings, values of AU (Administrative Unit) pointers included in H1 bytes and H2 bytes which have been defined to show head portions of the virtual containers in case where the low capacity containers are contained in a payload, at the 4th row of an SOH (Section Overhead) frame in which said plurality of frames are frames of an STM (Synchronous transfer mode) and are added to the payload of the frame of the STM, and a value of H4 byte which has been defined at the 6th row of a POH (Pass Overhead) added to the head portions of the respective virtual containers when the plurality of frames are frames of the STM (Synchronous transfer mode) and the virtual containers included in the frames of the STM are a VC-3 format or a VC-4 format.

14. The transmission state indicating apparatus according to claim 8, further comprising:

25 a frame converting unit which converts the multiplexed frame acquired by the multiplexed frame acquiring unit into a concatenation mapping frame

according to the rules of concatenation mapping; and
an index value detecting unit which detects a
plurality of index values included in the concatenation
mapping frame converted according to rules of the
concatenation mapping by the frame converting unit.

5 15. A transmission state indicating apparatus
comprising:

a plurality of clock reproducing units, in
accordance with a predetermined transmission system,
10 high capacity data is divided into a plurality of low
capacity virtual containers and transmitted via a
plurality of channels which configure a communication
network based on clocks at the respective channels,
which reproduce clocks of the respective channels from
15 reception signals of a plurality of frames including
the plurality of low capacity virtual containers;

a plurality of frame receiving units which receive
the plurality of frames including the plurality of low
capacity virtual containers in which the high capacity
20 data is divided into the plurality of low capacity
virtual containers and transmitted via the plurality of
channels which configure the communication network,
corresponding to the plurality of the respective
channels, and detect the virtual containers at the
25 respective channels based on the clocks of the
respective channels reproduced by the plurality of
clock reproducing units;

a reference clock generating unit which generates a reference clock;

a frame assembling unit which carries out mapping with respect to the virtual containers at the 5 respective channels included in the plurality of the frames received corresponding to the plurality of channels by the plurality of frame receiving units, based on the reference clock from the reference clock generating unit, accompanying delay absorption 10 processings corresponding to the transmission states of the respective channels, so as to be a multiplexed frame;

a pointer value detecting unit which successively detects factors at the respective channels which are 15 respectively included in the plurality of frames included in the multiplexed frame on which mapping has been carried out by the frame assembling unit, and which are to be objects for delay absorption processings corresponding to the transmission states at the 20 respective channels, as a plurality of pointer values for respectively evaluating transmission states at the plurality of channels which configure the communication network, and successively corrects the plurality of pointer values based on variations in phases at the 25 respective channels to be detected from phase differences between the clocks at the respective channels reproduced by the plurality of clock

reproducing units and the reference clock generated by the reference clock generating unit;

an information storage unit which stores the plurality of pointer values successively detected and corrected by the pointer value detecting unit in association with information for indicating the plurality of pointer values in accordance with the plurality of channels; and

a display unit which indicates the plurality of pointer values for respectively evaluating the transmission states of the plurality of channels which configure the communication network, at the same time corresponding to the plurality of channels, based on the plurality of pointer values and the information for indicating the plurality of pointer values corresponding to the plurality of channels which have been stored in association with one another in the information storage unit.

16. The transmission state indicating apparatus according to claim 15, further comprising:

a control unit which carries out processing for indicating the plurality of pointer values by relative values with respect to a pointer value of a reference channel to be a reference among the plurality of channels on the display unit.

17. The transmission state indicating apparatus according to claim 15, wherein, when the predetermined

transmission system is an SDH (Synchronous Digital Hierarchy) system, the plurality of pointer values include, as factors of the respective channels to be objects for the delay absorption processings, values of 5 AU (Administrative Unit) pointers included in H1 bytes and H2 bytes which have been defined to show head portions of the virtual containers in case where the low capacity containers are contained in a payload, at the 4th row of an SOH (Section Overhead) frame in 10 which the plurality of frames are frames of an STM (Synchronous transfer mode) and are added to the payload of the frame of the STM.

18. The transmission state indicating apparatus according to claim 15, wherein, when the predetermined 15 transmission system is an SDH (Synchronous Digital Hierarchy) system, the plurality of pointer values include, as factors of the respective channels to be objects for the delay absorption processings, a value of H4 byte which has been defined at the 6th row of a POH (Pass Overhead) added to head portions of the 20 respective virtual containers in case where the plurality of frames are frames of an STM (Synchronous transfer mode) and the virtual containers included in the frames of the STM are a VC-3 format or a VC-4 25 format.

19. The transmission state indicating apparatus according to claim 15, wherein, when the predetermined

transmission system is an SDH (Synchronous Digital Hierarchy) system, the plurality of pointer values include, as factors of the respective channels to be objects for the delay absorption processings, values of 5 AU (Administrative Unit) pointers included in H1 bytes and H2 bytes which have been defined to show head portions of the virtual containers in case where the low capacity containers are contained in a payload, at the 4th row of an SOH (Section Overhead) frame in 10 which the plurality of frames are frames of an STM (Synchronous transfer mode) and are added to the payload of the frame of the STM, and a value of H4 byte which has been defined at the 6th row of a POH (Pass Overhead) added to the head portions of the respective 15 virtual containers in case where said plurality of frames are frames of the STM (Synchronous transfer mode) and the virtual containers included in the frames of the STM are a VC-3 format or a VC-4 format.

20. The transmission state indicating apparatus according to claim 15, further comprising:

25 a frame converting unit which converts the multiplexed frame on which mapping has been carried out by the frame assembling unit into a concatenation mapping frame according to rules of concatenation mapping; and

an index value detecting unit which detects a plurality of index values included in the concatenation

mapping frame converted according to the rules of the concatenation mapping by the frame converting unit.